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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/077,072	02/14/2002	Andreas Fischer	P0877	3504

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EXAMINER
LEE, WILSON

ART UNIT	PAPER NUMBER
2821	

DATE MAILED: 06/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/077,072	FISCHER ET AL.	
	Examiner	Art Unit	
	Wilson Lee	2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 March 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6-15,18 and 19* is/are rejected.

7)☒ Claim(s) *3-5,16 and 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *labeled Figure 2 of Li* .

Claim Rejections – 35 U.S.C. 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 6-15, 18 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Li et al. (6,178,919).

Regarding Claim 1, Li discloses a plasma processing chamber configured to generate a confined plasma (130) (See Figure 2 and Col. 4, lines 30-45), comprising:

- A bottom electrode (110) as a first powered electrode configured to receive a work piece (substrate 114), the first powered electrode (110) having a first electrode area (the top surface of the first electrode 110);
- A RF power source (112) as a power generator operatively coupled to the first powered electrode (110) and configured to communicate power to the first powered electrode (110);
- A top electrode (104) as a second electrode disposed at a distance from the first powered electrode (110), the first powered electrode (110) and the second electrode configured to convert the gas to a plasma (See Col. 2, lines 53-56), the second electrode (104) have a second electrode area (the under part of the second electrode 104);
- A plurality of confinement rings (124) surrounding the confined plasma (See Figure 2); and

- a ground extension (not shown in figure but shown in his teachings) adjacent said first powered electrode (110) and surrounding the first powered electrode (110) since Li teaches that the chamber wall (102) which surrounds the first electrode (110) can be coupled to ground (See attached Figure 2, Col. 2, lines 34-45 and Col. 4, lines 9-12).

Regarding Claim 2, Li discloses a confinement ring (122) configured to confine said plasma, the one confinement ring (122) surrounding said first powered electrode (110) (See Figure 2).

Regarding Claim 6, Li discloses that the ground extension (not shown in figure but shown in his teachings) surrounds said first powered electrode (110) since Li teaches that the chamber wall (102) which surrounds the first electrode (110) can be coupled to ground (See attached Figure 2, Col. 2, lines 34-45 and Col. 4, lines 9-12).

Regarding Claim 7, Li discloses that ground extension (not shown in figure but shown in his teachings) is configured to drain charge (electron) from said plasma since Li teaches that the chamber wall (102) can be coupled to ground (See attached Figure 2, Col. 2, lines 34-45 and Col. 4, lines 9-12).

Regarding Claim 8, since Li discloses that the second electrode area (the under part of the second electrode 104) is greater than the first electrode area (the surface of the first electrode 110) (See Figure 2). Therefore, the electrode area ratio would be greater than 1.0 if the area ratio defined by dividing the second electrode area by the first electrode area.

Regarding Claim 9, Li discloses that the second electrode (110) further comprises a notch (labeled by examiner in attached Figure 2), the notch configured to increase said second electrode area (See attached Figure 2).

Regarding Claim 10, Li discloses that the ground extension (not shown in figure but it is taught by Li) surrounds the first powered electrode (110). For example, ground terminals supposedly coupled to the walls 102) surrounds the first power electrode (110) since Li teaches that the chamber wall (102) which surrounds the first electrode (110) can be coupled to ground (See attached Figure 2, Col. 2, lines 34-45 and Col. 4, lines 9-12).

Regarding Claim 11, Li discloses that ground extension (not shown in figure but it is taught by Li) is configured to drain charge (electron) from the plasma since Li teaches that the chamber wall (102) can be coupled to ground (See Figure 2, Col. 2, lines 34-45 and Col. 4, lines 9-12).

Regarding Claim 12, since Li discloses that the second electrode area (the under part of the second electrode 104) is greater than the first electrode area (the top surface of the first electrode 110) (See Figure 2). Therefore, the electrode area ratio would be greater than 1.0 if the area ratio defined by dividing the second electrode area by the first electrode area.

Regarding Claim 13, Li discloses a plasma processing chamber configured to generate a confined plasma (130) (See Figure 2 and Col. 4, lines 30-45), comprising:

- A bottom electrode (110) a first powered electrode configured to receive a work piece (substrate 114), the first powered electrode (110) having a first electrode area (the top surface of the first electrode 110);
- A RF power source (112) as a power generator operatively coupled to the first powered electrode (110) and configured to communicate power to the first powered electrode (110);
- A top electrode (104) as a second electrode disposed at a distance (132) from the first powered electrode, the first powered electrode (110) and the second electrode (104) configured to convert the gas to a plasma (130) (See Col. 2, lines 53-56) and the second electrode (104) having a second electrode area (the surface under the flat electrode 104);
- a ground extension (not shown in figure but shown in his teachings) adjacent the first powered electrode (110) and surrounding said first powered electrode (110) since Li teaches that the chamber wall (102) which surrounds the first electrode (110) can be coupled to ground (See Col. 4, lines 9-12), the ground extension separated from the first powered electrode (110) by a dielectric (Teflon shroud 120. See Col. 2, line 25); and
- A plurality of confinement rings (124) surrounding the first powered electrode (110) and the second electrode (104).

Regarding Claim 14, Li discloses that ground extension (not shown in figure but it is taught by Li) is configured to drain charge from said plasma (See attached Figure 2)

since Li teaches that the chamber wall (102) which surrounds the first electrode (110) can be coupled to ground (See Col. 2, lines 34-45 and Col. 4, lines 9-12).

Regarding Claim 15, since Li discloses that the second electrode area (the under part or surface of the second electrode 104) is greater than the first electrode area (the top surface of the first electrode 110) (See Figure 2). Therefore, the electrode area ratio would be greater than 1.0 if the area ratio defined by dividing the second electrode area by the first electrode area.

Regarding Claim 18, Li discloses a method for generating a confined plasma in a plasma processing chamber (See Figure 2) including a plurality of confinement rings (124) surrounding the confined ring plasma (130), the method comprising:

- receiving a gas (from apertures 105. See Col. 4, lines 13-14) in the plasma processing chamber (See Col. 4, lines 30-35);
- causing a bottom electrode (110) as a first electrode to receive a work piece (substrate 114) the first electrode (110) operatively coupled to a power supply (112);
- causing a top electrode (104) as a second electrode disposed at a distance (132) from the first electrode (110) to receive RF power from the first electrode, the second electrode (104) having a second electrode area that is greater than said first electrode area (See Figure 2);
- engaging a power supply (112) to communicate RF power to the first electrode (110) to generate a plasma; and

- causing a ground extension (not shown in figure but shown in his teachings) adjacent the first electrode (110) to drain a plurality of charge (electrons) from the plasma since Li teaches that the chamber wall (102) which surrounds the first electrode (110) can be coupled to ground (See Col. 4, lines 9-12).

Regarding Claim 19, Li discloses draining (e.g. grounding) the plurality of charge (electron) at a plasma boundary defined by at least one confinement ring (122) (See Figure 2 and Col. 2, lines 34-45).

Allowable subject matter

Claims 3-5, 16, 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art neither discloses nor suggests the ground extension further comprising a protrusion such as required by claims 3 and 16.

Response to Arguments

Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Wilson Lee whose telephone number is (703) 306-3426. Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center receptionist whose telephone number is (703) 308-0956. The Technology Center Fax Center number is (703) 308-7722 or (703) 308-7724.

Patent Examiner
Art Unit 2821
U.S. Patent & Trademark Office

WL
6/13/03

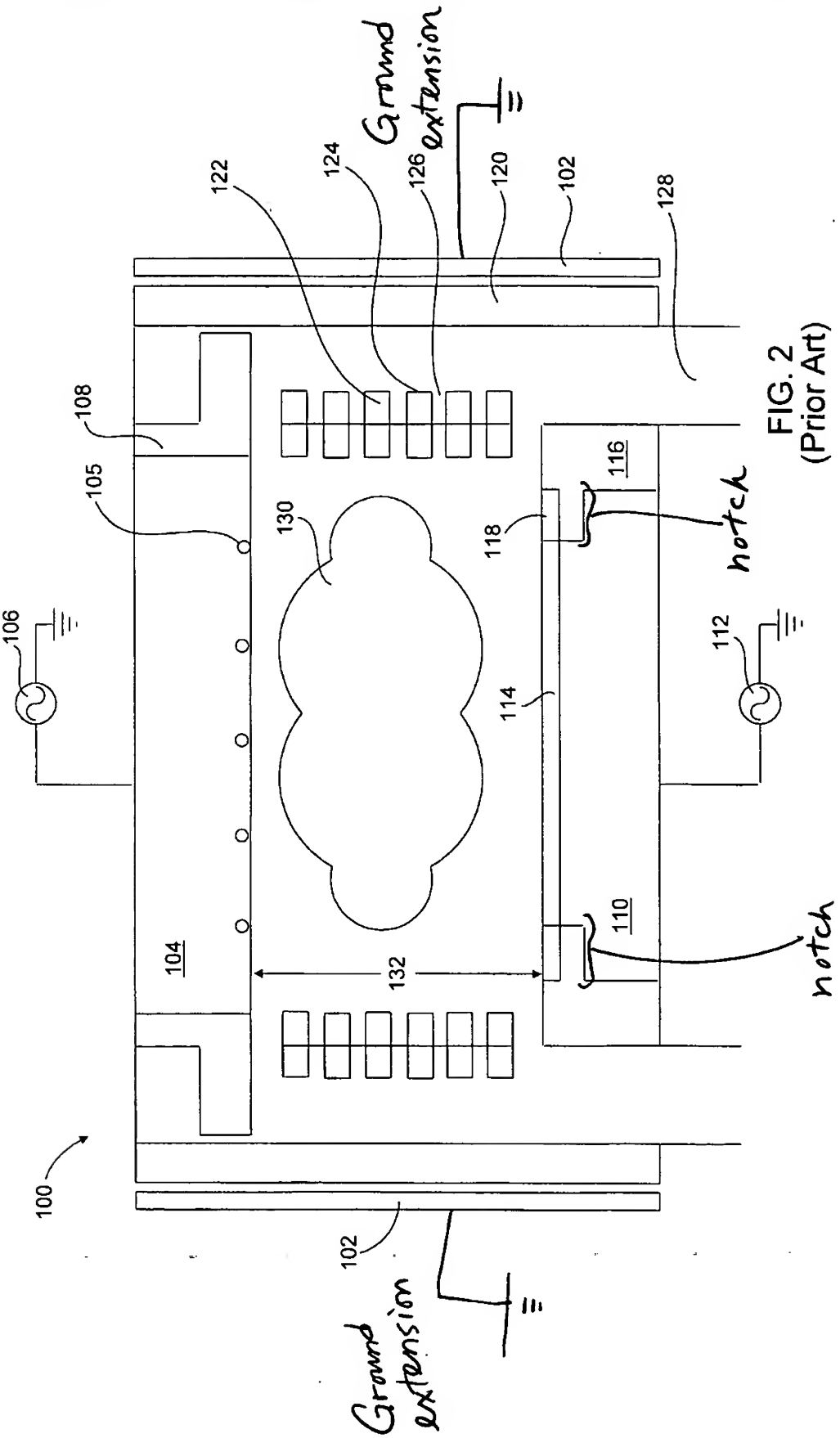

FIG. 2
(Prior Art)